CALFED BAY-DELTA PROGRAM

MEETINGS SUMMARY
FEBRUARY 18-21, 1997

The CALFED Bay-Delta Program (CALFED) held a series of meetings from February 18 through February 21, 1997 with the Fish and Aquatic Ecosystem Assessment Methods Team and other key agency and stakeholder representatives. The purpose of these meetings was to select assessment methods for fish and the aquatic ecosystem for use in CALFED's Programmatic Environmental Impact Report/Environmental Impact Statement (EIR/EIS). The methods will be used to assess the beneficial and detrimental impacts of CALFED actions on fish and on the aquatic ecosystem.

At the meeting on February 18, 1997, the Phase II components and alternatives, with an emphasis on the potential to affect fish and the aquatic ecosystem, were presented to the team members and discussed. The accomplishments of the team and the selection process developed by the team were also reviewed. Following the introductory meeting on February 18, three subsequent meetings were held to select assessment methods appropriate for evaluating chinook salmon and steelhead trout (February 19), estuarine species (February 20), and other resident and reservoir fish species (February 21).

FEBRUARY 18, 1997: INTRODUCTORY MEETING

During the review of the selection process for assessment methods at the introductory meeting on February 18, concerns regarding selection of fish assessment methods and/or conducting the impact assessment were identified.

- Ecosystem vs. Species-Specific Approach. There was concern that the CALFED approach, as presented, was too species-specific and therefore too narrow. Participants agreed that ecosystem functions should be emphasized more during the impact assessments. However, they also recognized that ecosystem functions are necessarily tied to species, and that species can be used as indicators of ecosystem dynamics.

- Current vs. Future Flow Relationships. Fundamental flow relationships relative to fish may change if operations and ecosystem structure change. Current relationships are based on operation of current facilities. New facilities or changes in operations of existing facilities may necessitate reassessment of relationships. There was concern that flow was emphasized too much as an assessment variable in the CALFED approach.

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FEBRUARY 19-21, 1997: SELECTION OF METHODS

In response to the concerns raised at the February 18 meeting, CALFED staff shifted the focus of the assessment methods selection process from species to ecological function. Meeting participants were asked to review the 12 important ecological functions previously identified by the team and provide input on the assessment methods, assessment variables, species and life-stage applicability, and other important considerations or qualifications. The following is a summary of key considerations and qualifications provided by the team for each ecological function.

LOSS TO ADVERSE WATER TEMPERATURE

Temperature range, change, duration, location, and timing should be incorporated into methods for assessing loss to adverse water temperature. Alternatives to temperature models (e.g., professional judgement about air temperature, flow, riparian habitat, habitat diversity, channel configuration) may be the only information available for estimating temperature on some streams. Species- and life-stage-specific temperature-mortality and temperature-spawning relationships need to be incorporated in the temperature evaluation together with professional judgement. Water temperature can have secondary effects on predation, disease, and effects of contaminants.

LOSS TO DIVERSION

Assessment methods should consider diversion location, size, duration, and distance of opening from main flow. Screen efficiency and fish location/timing also are important. Removing (but not consolidating) diversions could reduce fish loss. The volume of each diversion is important. Proportionally more fish are lost at larger diversions. In the Delta, salinity may affect loss to diversion and entrainment of fish is more important than diversion. Also, timing may be more critical for Delta species, and diversion volume less critical. Vertical position of intake may be important for some species. With multiple diversions, there is potential operational flexibility if the location of the fish is known.

LOSS TO CHANGE IN WATER SURFACE LEVEL

Location, duration, and timing of water surface level change may affect fish loss. Maintaining water surface at stable levels for extended periods of time is beneficial to affected species and their life stages. Habitat restoration to reduce fish loss may include change in channel configuration, floodplain structure, or habitat type. Maintenance of water level in streams and reservoirs would especially benefit species that spawn in shallow water.

Loss to Toxicants

Assessment methods need to consider toxicant load reduction at a given flow and resuspension and release resulting from dredging or disturbance of sediments. Fish loss should include reduced reproductive success or other sublethal effects. Chemical interactions (e.g., combining into more toxic byproducts) and toxicant distribution may be important. Species- and life-stage-specific ranges of toxicity may need to be identified. Crop types and cropping patterns may be important when considering agricultural return flows. After spring rains, higher flows may <u>increase</u> the input of dormant pesticides from agricultural lands. Restoration of riparian, floodplain, and margin areas can reduce toxicant concentrations. Short- and long-term effects of toxicants need to be considered. Foodweb effects and bioaccumulation may be important.

Loss to Harvest

Harvest is linked to hatchery production. Poaching should be included in loss to harvest. Age structure of populations and stock-recruitment relationships may be important for impact assessment. Changes in harvest rates may be important.

Loss to Predation

Non-native species may be especially important. Predator size and association with prey (location/timing) should be considered. The hatchery stocking program for striped bass is an issue. Predation <u>will</u> occur on listed species. Focus should be on modifying environmental conditions to discourage or reduce predators.

Loss to Transport

Duration and timing of fish in the Delta need to be considered. Changing flow patterns may change habitat in the Delta. Natural hydrologic conditions should be imitated wherever possible. Increased habitat and/or facility isolation may reduce transport problems. Insufficient flow can increase transport time, increasing mortality. Flow magnitude needs to be included in assessment; flow duration, location, and timing are important.

<u>Note</u>: "Loss to Inadequate Transport" has been changed to "Loss to Transport" and concerns passive movement, usually of eggs, larvae, and juveniles.

Loss to Attraction

Barriers could be constructed to direct migrating salmonids toward appropriate locations. Pulse flows could be used to enhance migratory cues. Water quality (e.g., turbidity, temperature) also may affect these cues.

Note: "Loss to Attraction to Nonsalmonid Habitat" has been changed to "Loss to Attraction" and concerns active movement, primarily of migrating juveniles and adults.

PROVISION OF HABITAT

Participants agreed that physical habitat (e.g., riparian, channel, floodplain, shallow-water area), water temperature, salinity, and flow are important. Flow volume may be coupled with habitat restoration actions. Functioning floodplains, sediment sources, and scour points need to be considered. Weighted usable area (WUA) can provide a general indication of whether flow increases or decreases are beneficial or detrimental. A definite positive relationship between WUA and fish production is not supported by data. Channel maintenance flows are not included in WUA flows, but should be included under improvements to spawning habitat. The location of habitat restoration in the Delta, including geographic location of shallow-water habitat, and substrate and water velocity may be important. Erosion/deposition can affect habitat and should be considered. In reservoirs, habitat is linked to water surface level and slopes of reservoirs.

FOODWEB SUPPORT

Erosion and deposition may affect habitat quality for food organisms. In the Delta, water residence time may affect phytoplankton production and the foodweb. Non-native species need to be considered. Changes in Delta hydraulics can affect habitat, water circulation, etc., which may affect food organisms. In reservoirs, drawdown timing, duration, and interval can affect foodweb support. Food production is related to volume, surface area, and water level.

ACCESS TO CONNECTED HABITATS

Trucking of juvenile salmonids, flow, and Delta export may affect straying. Barriers affect hydraulics, which could affect migration patterns through the Delta. In reservoirs, drawdown may impede access of rainbow trout to their spawning streams.

SUPPORT OF LIFE-HISTORY DIVERSITY

Current hatchery operations are detrimental to wild stocks of chinook salmon and steelhead trout. Ocean harvest rates are driven by hatchery production. Reduced hatchery production may increase natural population abundance if harvest rates do not change. Conversely, increase in number of hatchery fish may decrease natural population abundance. New habitat could be utilized by hatchery-produced fish. Hatchery fish may compete with wild fish. Impacts on the total population and natural proportion of the population need to be considered.